

## WHAT IS CLAIMED IS:

1           1.     A tape head module assembly system, comprising:  
 2           a support base, the support base having a surface area;  
 3           a first module holder for holding a first tape head sub-assembly;  
 4           a first position controller for adjusting and setting a position of the first module  
 5 holder;  
 6           a second module holder for holding a second tape head sub-assembly; and  
 7           a second position controller for adjusting and setting a position of the second  
 8 module holder;  
 9           wherein the first and second module holders are placed on the support base  
 10 with a module end of each of the first and second module holders disposed on the  
 11 surface area, the first and second position controllers adjusted to align the first and  
 12 second tape head sub-assemblies and to allow the coupling of the first and second  
 13 tape head sub-assemblies after alignment.

1           2.     The tape head module assembly system of claim 1 wherein the  
 2 surface area comprises a hard transparent planar surface area.

1           3.     The tape head module assembly system of claim 1 wherein the  
 2 surface area is narrower than a tape head sub-assembly.

1           4.     The tape head module assembly system of claim 1 wherein the first  
 2 position controller comprises an elevation control for adjusting a height of a rear  
 3 portion of the first module holder.

1           5.     The tape head module assembly system of claim 1 wherein the first  
2 module holder comprises a translation structure for allowing a rear portion of the first  
3 module holder to be rotated.

1           6.     The tape head module assembly system of claim 1 wherein the first  
2 module holder comprises a pivot structure disposed at the module end, the pivot  
3 structure enabling the first module holder to pivot about an axis at the pivot  
4 structure.

1           7.     The tape head module assembly system of claim 6 wherein the first  
2 position controller comprises a first module holder anchor, the first module holder  
3 anchor comprising a moveable plate and a pivot structure engaging arrangement,  
4 the first module holder anchor engaging the pivot structure of the first module holder  
5 to hold the first module holder so that the first module holder pivots about the axis at  
6 the pivot structure.

1           8.     The tape head module assembly system of claim 7 wherein the first  
2 position controller further comprises a lateral adjuster for causing a rear portion of  
3 the first module holder to move in a lateral motion to cause the first module holder to  
4 pivot about an axis approximate the module end of the first module holder.

1           9.     The tape head module assembly system of claim 1 wherein the first  
2 position controller further comprises a lateral adjuster for causing a rear portion of  
3 the first module holder to move in a lateral motion to cause the first module holder to  
4 pivot about an axis approximate the module end of the first module holder.

1           10.    The tape head module assembly system of claim 1 wherein the  
2   second position controller comprises an elevation control for adjusting a height of a  
3   rear portion of the second module holder.

1           11.    The tape head module assembly system of claim 1 wherein the  
2   second module holder comprises a linear translation structure for allowing the  
3   second module holder to be translated linearly toward or away from the first module  
4   holder.

1           12.    The tape head module assembly system of claim 1 wherein the  
2   second module holder comprises a securement structure disposed at the module  
3   end, the securement structure enabling the second module holder to move linearly  
4   toward or away from the first module holder.

1           13.    The tape head module assembly system of claim 12 wherein the  
2   second position controller comprises a second module holder anchor, the second  
3   module holder anchor comprising a moveable plate and an engaging arrangement,  
4   the second module holder anchor engaging the securement structure of the second  
5   module holder to restrict movement of the second module holder so that the second  
6   module holder moves linearly toward or away from the first module holder.

1           14.    The tape head module assembly system of claim 13 wherein the  
2   second position controller further comprises a lateral adjuster for causing the second  
3   module holder to move in a lateral motion to allow the second module holder to be  
4   aligned laterally with the first module holder.

1           15.    The tape head module assembly system of claim 1 wherein the  
2 second position controller further comprises a lateral adjuster for causing the second  
3 module holder to move in a lateral motion to allow the second module holder to be  
4 aligned laterally with the first module holder.

1           16.    The tape head module assembly system of claim 1 wherein each of  
2 the first and second module holders further comprise:  
3           an arm having a grasping structure; and  
4           an opposable piece forcibly engaging against the grasping structure to form a  
5 jaw for holding a tape head module therein, wherein the arm further comprises a slot  
6 disposed toward the rear of the arm and a first shaft disposed at a module end of  
7 the module holder.

1           17.    The tape head module assembly system of claim 16 wherein the  
2 second module holder further comprises a second shaft extending away from the  
3 module end at the rear of the module holder, the second shaft providing a point for  
4 urging the second module holder toward the first module holder.

1           18.    The tape head module assembly system of claim 1 wherein each of  
2 the first and second module holders further comprise a vacuum arrangement for  
3 holding a tape head module therein.

1        19.    A tape head module assembly method, comprising:  
2        placing a first and second module holder in an initial state with module holder  
3        ends facing each other, the module ends each holding a tape head module;  
4        setting a tape wrap angle between the first and second module by performing  
5        initial alignment and lifting a rear end of the first and second module holder a  
6        prescribed amount;  
7        selecting a horizontal alignment for the first module holder so that gaps  
8        between the first and second modules are parallel;  
9        selecting an alignment along a longitudinal axis for the second module  
10       holder;  
11       translating the second module laterally until the second tape head module  
12       held by the second module holder is aligned with the first tape head module held by  
13       the first module holder to provide reader-opposite-writer track-to-track registration;  
14       and  
15       joining the first and second tape head modules together using a joining agent  
16       in the gap between the first and second tape head modules.

1           20.    The tape head module assembly method of claim 19 wherein the  
2   placing a first and second module holder further comprises placing the first and  
3   second module holder on a hard transparent surface and wherein the performing  
4   initial alignment further comprises establishing a startup point and using optical  
5   fringe measurements between the modules and the hard transparent surface to  
6   adjust for minimum fringe interference patterns thereby achieving optimal alignment  
7   of the modules.

1           21.    The tape head module assembly method of claim 20 wherein the  
2   surface area is narrower than a tape head sub-assembly.

1           22.    A module holder, comprising:  
2           an arm having a grasping structure; and  
3           an opposable piece forcibly engaging against the grasping structure to form a  
4   jaw for holding a tape head module therein, wherein the arm further comprises a slot  
5   disposed toward the rear of the arm and a first shaft disposed at a module end of  
6   the module holder.

1           23.    The module holder of claim 22 further comprising a second shaft  
2   extending away from the module end at the rear of the module holder, the second  
3   shaft providing a point for urging the second module holder toward the first module  
4   holder.